

DISPENSER

Cross-References to Related Applications

This is a continuation-in-part of U.S. Patent Application 10/686,182, filed 15 October 2003, which, in turn, claims priority under 35 U.S.C. § 119(e) to U.S. Provisional Application No. 60/497,585, filed 25 August 2003, each hereby incorporated by reference.

Background

1. Field of the Invention

This invention relates to dispensers and, in particular, this invention relates to devices which are attachable to containers for dispensing a substantially flowable material urged from the containers, and which can be resealed between uses.

2. Background

Containers for many flowable materials, such as glue and other adhesives, must often be sealed between uses and must further aid in dispensing the flowable materials onto surfaces in desired amounts. To this end, these containers often include a resealable dispenser which is threadably attached to a container. To be resealed, these dispensers often have a cap attached by a loop or similar structure to an elongated dispenser neck. Even when in a closed position, thereby sealing the container, the cap can often be easily rotated, thereby compromising the seal. These rotatable caps are also less desirable to consumers because they are not uniformly oriented in display cases. Moreover, in situations where persons frequently use these containers, it is more efficient time-wise when the same manual motions can be used to remove and replace the caps from the dispensers. Hence, rotatable caps may also be less desirable functionally because dispensers with different orientations usually cannot be opened and closed with repeated similar manual motions. These easily rotatable caps also usually lack any other structure further promoting an airtight seal. In certain situations, however, a rotatable dispenser cap may be desirable. Situations where a rotatable cap is desirable is when the cap must be rotated to more efficiently dispense the contents from the container or to more efficiently close the container after use. However, if the cap is rotatable, the dispenser must nonetheless provide an air tight seal regardless of the rotational

position of its components.

Present dispensers also often include structures within the dispensers, which open and close the pathway for delivering the flowable materials. While these dispensers have the advantage of usually not requiring a separate cap, they are subject to clogging when materials left in the dispenser pathways are partially dried.

There is then a need for a dispenser with either a fixed, non-rotational sealing cap, which is easily resealed between uses or a dispenser which has components which can be rotated, but nonetheless provide an air tight seal. There is a particular need for either of these types of dispensers with a pathway from which obstructions can be easily cleared.

Summary of the Invention

This invention substantially fulfills the aforementioned needs by providing a dispenser with either a fixed, non-rotational sealing cap or a cap which has components that can be rotated but which nonetheless will provide an air tight or fluid tight seal. Both embodiments are easily sealed between uses, and have a pathway from which obstructions are readily and easily cleared. The instant invention provides a dispenser and associated methods of use and manufacture for a flowable product or material urged from a container. The dispenser may be reversibly attachable to the container, e.g., by threads. In one embodiment, the present dispenser includes a base, first and second members, and a cap. The base may be attachable to the container. The first member may be attachable to the base and may include a generally frustoconical extension with a tapered tip. The cap may have a lower edge radially extending from the extension. The first member may define a pathway for the flowable material when the flowable material is urged from the container. The second member may be disposable about the first member extension. The cap may be hinged to the second member. The cap may include a mating structure to ensure that an airtight seal is effected when the cap is in a closed position. One embodiment of the present dispenser includes one or more other mating structures, which maintain the instant cap in a defined, constant non-rotational orientation. Another embodiment includes rotatable components that can nonetheless provide an air tight or fluid tight seal.

It is a feature of the present dispenser to define a pathway which is easily accessed throughout.

It is an advantage of the foregoing feature that obstructions can be easily and quickly cleared from the pathway.

It is a feature of a first embodiment of the present dispenser to include at least one mating structure.

5 It is an advantage of the foregoing feature that the present dispenser sealing cap is uniformly oriented.

It is another advantage of the foregoing feature that containers with the instant dispenser present a more desirable appearance in displays.

10 It is yet another advantage of the foregoing feature that containers are more easily and efficiently opened and closed.

It is still another advantage of the foregoing feature that one aspect of the mating structure may enable an airtight seal between the cap and the remainder of the dispenser.

It is a feature of a second embodiment of the present dispenser to include rotatable components.

15 It is an advantage of the foregoing feature that the components provide an air tight seal or a fluid tight seal after being rotated to a convenient rotational position.

It is another advantage of the foregoing feature that the components may be rotated to a convenient rotational position for dispensing the material from the container.

20 It is yet another advantage of the foregoing feature that the components may be rotated to a convenient rotational position for opening and closing (sealing) the dispenser.

These and other objects, features, and advantages of this invention will become apparent from the description which follows, when considered in view of the accompanying drawings.

25 Brief Description of the Drawings

Figure 1 is a side view of an assembled first embodiment of the present dispenser, the cap thereof in a closed position;

Figure 2 is a perspective view of the assembled dispenser of Figure 1, the cap thereof in an open position;

30 Figure 3 is a bottom view of the present assembled dispenser of Figure 1, the cap thereof in the open position;

Figure 4 is a perspective view of the base of the dispenser of Figure 1;

Figure 5 is a bottom view of the base of Figure 4;

Figure 6 is a perspective view of a first member of the dispenser of Figure 1;

Figure 7 is a bottom view of the first member of Figure of Figure 6;

5 Figure 8 is a top view of a second member and attached cap of the dispenser of Figure 1;

Figure 9 is a top view of the second member and cap of Figure 8;

Figure 10 is a side view of an assembled second embodiment of the present dispenser, the cap thereof in a closed position;

10 Figure 11 is a perspective view of the assembled dispenser of Figure 10, the cap thereof in an open position;

Figure 12 is a bottom view of the assembled dispenser of Figure 10, the cap thereof in the open position;

Figure 13 is a perspective view of the base of the dispenser of Figure 10;

15 Figure 14 is a bottom view of the base of Figure 13;

Figure 15 is a perspective view of a first member of the dispenser of Figure 10;

Figure 16 is a bottom view of the first member of Figure 15;

Figure 17 is a perspective view of a second member and attached cap of the dispenser of Figure 10;

20 Figure 18 is a top view of the second member of Figure 17;

Figure 19 is a bottom view of the second member of Figure 17;

Figure 20 is a cross sectional view of the dispenser of Figure 10, the cap thereof in the open position; and

25 Figure 21 is a cross sectional view of the dispenser of Figure 10, the cap thereof in the closed position.

It is understood that the above-described figures are only illustrative of the present invention and are not contemplated to limit the scope thereof.

Detailed Description

30 Any references to such relative terms as inner and outer, upper and lower, or the like, are intended for convenience of description and are not intended to limit the present invention

or its components to any one positional or spatial orientation. All dimensions of the components in the attached figures may vary with a potential design and the intended use of an embodiment of the invention without departing from the scope of the invention.

Each of the features and methods disclosed herein may be utilized separately or in conjunction with other features and methods to provide improved dispensers and methods for making and using the same. A representative example of the present invention, which utilizes many of these features and methods, will now be described in detail with reference to the drawings. This detailed description is merely intended to teach a person of skill in the art further details for practicing preferred aspects of the present teachings and is not intended to limit the scope of the invention. Therefore, combinations of features and methods disclosed in the following detailed description may not be necessary to practice the invention in the broadest sense, and are instead taught merely to particularly describe a representative and preferred embodiment of the invention.

The present dispenser may reversibly attach to a container and may be advantageously used to dispense a substantially flowable material, such as glue or another adhesive, from the container. The dispenser may include mating structures, which help maintain airtight seals necessary to preserve the material being stored and dispensed. The mating structures also insure that the caps functionally present on the dispenser will be uniformly oriented. Uniform orientation is desirable to consumers viewing displays of the containers and dispensers. Uniform orientation is also desirable to persons frequently opening and closing the dispensers because similar motions and manipulations are required to open and close the dispensers. Moreover, the instant dispenser provides a channel for the material which is easily cleaned, thereby curing clogging problems which would otherwise arise.

A first assembled embodiment of the present dispenser is depicted in Figures 1-3 generally at 100 and includes a base, such as a collar 102, a first member, such as a cone 104, a second member, such as a cover 106, and a sealing member such as a cap 108. The instant dispenser, and many components thereof, may be described by an axis 110. It can be seen in Figures 1-5 that the base 102, in turn, includes an upper member 112 unitarily (or otherwise integrally) joined to a cylindrical element 114. The upper member 112 displays respective upper and lower surfaces 118 and 120, defines a generally coaxial opening 122 and includes a mating structure such as a plurality (e.g., a pair) of tabs 124, which are generally opposed in

the embodiment shown. Externally, the upper member 112 adjoins the cylindrical element 114 at a bevel 126.

The bevel 126 may be between about 40 degrees and 50 degrees or about 45 degrees in some aspects of the invention. The cylindrical element 114 displays an outer surface 128, an inner surface 130, and a lower rim 132. A plurality of gripping surfaces, such as ribs 134, may extend from the outer surface 128 and a connecting structure, such as a plurality of threads 136, may be defined by the inner surface 120. A person of ordinary skill in the art will readily recognize that other connecting structures may be suitable for other embodiments. Moreover, it is contemplated that, in some embodiments, the present invention may be permanently attached to the container. In the embodiment shown, the ribs 134 unitarily (or otherwise integrally) and orthogonally adjoin the rim 132.

As best viewed in Figures 1-3 and 6-7, the first member 104 includes a lower flange 146, respective first and second elements 148 and 150, and an upper extension 152. The lower flange 146 includes a mating structure, such as a plurality (e.g., pair) of slots 154, and displays respective upper and outer surfaces 156 and 158 and an outer rim 160. Obviously, the tabs 124 and slots 154 could be interchanged.

The generally frustoconical first element 148 unitarily (or otherwise integrally) adjoins the lower flange 146, displaying an upper surface 164, and outer surface 166, and an inner surface 168. The first element outer surface 166 adjoins the lower flange upper surface 156 at a bevel 170.

The second generally frustoconical element 150 is disposed coaxially to the first element 148 and displays respective upper, lower, outer and inner surfaces 174, 175, 176, and 178. In the embodiment shown, the second element is stepped inwardly from the first element 148. A mating structure, such as a plurality (e.g., pair) of slots 180, are defined to adjoin the upper surface 174 and the outer surface 176. The slots 180 are expressed as tabs 182 extending from the inner surface 178 and the lower surface 175. The inner surfaces 168 and 178 of the first and second elements 148 and 150 and the lower surface 175 of the second element 150 define a cavity 184.

A third element, such as a generally frustoconical upper extension 152 displays an outer surface 186 and an inner surface 188 and includes a tip 190. The tip 190, in turn, displays an upper surface 192, which adjoins a bevel 194, the bevel 194 terminating at a lower

rim 196. The lower rim 196 may extend generally radially from adjacent surfaces on the upper extension 152. The inner surface 188 defines a generally coaxial bore 198. The bore 198 adjoins the cavity 184 and opens to admit a substantially liquid substance being forced from the cavity 184.

5 As best viewed in Figures 1-3 and 8-9, the second member (cover) 106 includes respective first and second elements 200 and 202. The element 200, in turn, displays an upper surface 203, an outer surface 204, an inner surface 206, and a lower rim 208. A mating structure, such as a plurality (e.g., pair) of tabs 210 depend from the lower surface 208 in the embodiment depicted. Obviously the slots 180 and tabs 210 could be interchanged. The
10 element 202 displays an upper surface 214, which extends radially from a rim 215. The element 202 further displays an exterior surface 216, defines another mating structure such as a generally circumferential groove 218, and includes an inner surface 220. The inner surface 220 defines a bore 222, the bore 222 dimensioned to accommodate the upper extension 152 therewithin.

15 In the embodiment shown, the cap 108 is attached to the second member 106 by a flexible hinge 226 and includes a cap element 128, an extension 130, and a stopper element 132. The hinge 226 may be formed simultaneously with the second member 106 and cap 108, e.g., by injection molding. Still another mating structure such as a generally circumferential rim 234 is defined proximate a junction between an interior surface 236 and a lower surface
20 238. The cap 108 is dimensioned so that the rib 234 is accommodated within the second member groove 218 and the lower surface 238 contacts the second member upper surface 203 when the cap 108 is in a closed position. Obviously, the rib 234 and groove 218 could be easily interchanged. The stopper element 232 is dimensioned to be accommodated within the tip bore 198 when the cap 108 is in a closed position as well.

25 Suitable materials for the first embodiment of the present dispenser include polyethylene, e.g., high density polyethylene, and polypropylene. However, other suitable materials can be found in the Handbook of Plastics, Elastomers, and Composites, Third Edition, Charles A. Harper, Editor-in-Chief, McGraw-Hill, New York (1996), the entire disclosure of which is hereby incorporated by reference. Individual components of the
30 present dispenser may be formed by processes such as injection molding utilizing the foregoing materials.

The first embodiment of present dispenser is assembled by extending the first member 104 through the base collar opening 122 until the flange upper surface 156 contacts the base collar lower surface 120 and the tabs 124 are accommodated in the flange slots 154. The second member 106 is forced into position, wherein the upper extension 152 is accommodated within the bore 222 and the second member tabs 210 are accommodated in the first member slots 180. The cap 108 is closed by being pressed against the second member 106 until the cap rib 234 is disposed within the second member circumferential groove 218 and until the cap stopper element 232 is disposed within the upper extension bore 198, thereby effecting a seal to prevent volatile ingredients within the flowable material from evaporating.

The instant mating structures help insure that assembled elements remain in a desired non-rotational orientation and that assembled elements further maintain the vapor-tight seal necessary to preserve the flowable material being stored and dispensed from the container. The fixed non-rotational relation ensures that the dispenser caps when present on containers will be oriented in substantially identical positions. The substantially identical positions are aesthetically desirable to consumers in displays. These substantially identical positions are also advantageous to persons frequently opening and closing containers when dispensing materials therefrom.

Functionally, the assembled present dispenser is attached to a container by threading the base 102 onto a container until a snug, airtight seal is effected by in part by contact between the base lower surface 120 and the first member flange 146 and between the first member flange 146 and the container. The airtight seal is also effected when the cap 108 is in a closed position as described above. To dispense the material from the container, the cap 108 is displaced from the closed position to an open position. The cap 108 may be displaced from the closed position to the open position by an upward force exerted on the extension 230, e.g., by a user's digit. The upward force displaces the stopper element 232 from the upper extension bore 198 and also displaces the cap rib 234 from the second member groove 218. The substantially flowable material may be then forced from the container through the first member cavity 184 and the upper extension bore 198 and dispensed on a surface at a desired location. The flowable material is forced or urged from the container, for example, by squeezing the sides of the container or by using a plunger (if present). After use, the cap is

replaced as described above to reseal the container and prevent the material within the container from deterioration due to evaporation.

A second assembled embodiment of the present dispenser is depicted in Figures 10-12 generally at 300 and includes a base such as a collar 302, a first member such as a cone 304, a second member such as a cover 306, and a sealing member such as a cap 308. The instant dispenser, and many components thereof, may be described by an axis 310. It can be seen in Figures 10-14 that the base 302, in turn, includes an upper member 312 unitarily (or otherwise integrally) joined to a cylindrical element 314. The upper member 312 displays respective upper and lower surfaces 318 and 320 and defines a generally coaxial opening 322. In contrast to the first embodiment, a mating structure such as a plurality (e.g., a pair) of tabs 124, are not present. Externally, the upper member 312 adjoins the cylindrical element 314 at a bevel 326.

The bevel 326 may be between about 40 degrees and 50 degrees or about 45 degrees in some aspects of the invention. The cylindrical element 314 displays an outer surface 328, an inner surface 330, and a lower rim 332. A plurality of gripping surfaces, such as ribs 334, may extend from the outer surface 328 and a connecting structure, such as a plurality of threads 336, may be defined by the inner surface 320. A person of ordinary skill in the art will readily recognize that other connecting structures may be suitable for other embodiments. Moreover, it is contemplated that, in some embodiments, the present invention may be permanently attached to the container.

As best viewed in Figures 10-12 and 15-16, the cone 304 includes a lower flange 346, a basal portion such as respective first and second elements 348 and 350, and an upper extension 352 and displays respective upper and lower surfaces 356 and 358 and an outer rim 360. In contrast to the first embodiment, the lower flange 346 does not include a mating structure, such as the plurality (e.g., pair) of slots 154.

The generally frustoconical first element 348 defines a slot 362 and unitarily (or otherwise integrally) adjoins the lower flange 346, displaying an upper surface 364, and outer surface 366, and an inner surface 368.

The second generally frustoconical element 350 is disposed coaxially to the first element 348 and displays respective upper, lower, outer and inner surfaces 374, 375, 376, and 378. In the embodiment shown, the second element is stepped inwardly from the first element

348. In contrast to the first embodiment, a mating structure, such as the plurality (e.g., pair) of slots 180, are not defined. The inner surfaces 368 and 378 of the first and second elements 348 and 350 and the lower surface 375 of the second element 350 define a cavity 384. An upper cylindrical element 380 extends from the frustoconical element 350 and displays
5 respective upper, lower, outer, and inner surfaces, 381, 382, 383, and 384, the upper and outer surfaces 380 and 383 joined at a bevel 385.

A third element, such as a generally frustoconical upper extension 352 extends from the upper cylindrical element 381, displays an outer surface 386 and an inner surface 388, and includes a tip 390. The tip 390, in turn, displays an upper surface 392, which adjoins a bevel
10 394, the bevel 394 terminating at a lower rim 396. The lower rim 396 may extend generally radially from adjacent surfaces on the upper extension 352. The inner surface 388 defines a generally coaxial bore 398. The bore 398 adjoins the cavity 399 and opens to admit a substantially liquid substance being forced from the cavity 399.

As best viewed in Figures 11-12 and 17-19 the second member (cover) 306 includes
15 respective first and second elements 400 and 402. The element 400, in turn, displays an upper surface 403, an outer surface 404, an inner surface 406, and a lower rim 408. In contrast to the first embodiment, a mating structure, such as a plurality (e.g., pair) of tabs 210, does not depend from the lower surface 408 in the embodiment depicted. The element 402 displays an upper surface 414, which extends radially from a rim 415. The element 402 further displays
20 an exterior surface 416, defines a mating structure such as a generally circumferential groove 418, and includes an inner surface 420. The inner surface 420 defines a bore 422, the bore 422 dimensioned to accommodate the upper extension 352 therewithin.

In the embodiment shown, the cap 308 is attached to the second member 306 by a flexible hinge 426 and includes a cap element 428, an extension 430, and a stopper element
25 432. The hinge 426 may be formed simultaneously with the second member 306 and cap 308, e.g., by injection molding. Still another mating structure such as a generally circumferential rib 434 is defined proximate a junction between an interior surface 436 and a lower surface 438. The cap 308 is dimensioned so that the rib 434 is accommodated within the second member groove 418 and the lower surface 438 contacts the second member upper surface 403
30 when the cap 308 is in a closed position. Obviously, the rib 434 and groove 418 could be interchanged. The stopper element 432 is dimensioned to be accommodated within the tip

bore 398 when the cap 308 is in a closed position as well.

Suitable materials for the second embodiment of the present dispenser include polyethylene, e.g., high density polyethylene, and polypropylene. In one situation, the collar 302 is made from high density polyethylene and the cap 308 and cone 304 are made from polypropylene. However, other suitable materials can be found in the Handbook of Plastics, Elastomers, and Composites, Third Edition, Charles A. Harper, Editor-in-Chief, McGraw-Hill, New York (1996), previously incorporated by reference. Individual components of the present dispenser may be formed by processes such as injection molding utilizing the foregoing materials.

As best seen in figures 20 and 21, the second embodiment of present dispenser is assembled by extending the first member 304 through the base collar opening 322 until the flange upper surface 356 contacts the base collar lower surface 320 and until the collar upper member 312 is disposed in the slot 362. The second member 306 is forced into position, wherein the upper extension 352 is accommodated within the bore 398. The cap 308 is closed by being pressed against the second member 306 until the cap rib 434 is disposed within the second member circumferential groove 418 and until the cap stopper element 432 is disposed within the upper extension bore 398, thereby effecting a seal to prevent volatile ingredients within the flowable material from evaporating. The cap 308 may be removed from the second member by pressing against a lower surface of the extension 430 in the direction indicated by the arrow 450, e.g., with between 0.5 and 1.5, or 1 pound of force, such that the cap rib 434 is displaced from the second member circumferential groove 418 in the direction of the arrow 452. With the cap 308 displaced from the sealing position into an open position, the material inside the container can be dispensed as desired.

In contrast to the first embodiment, the components are frictionally maintained in an assembled disposition by close tolerances. Also in contrast to the first embodiment, the components can be rotated when in place, yet maintain a fluid tight seal. While a fixed relationship is desirable in the first embodiment, an ability to freely rotate the cover 306 is desirable in some situations where, e.g., users need to adjust the rotational position of the cover 306 to more conveniently open and/or close the dispenser and dispense the contents. For certain uses, the first and second embodiments are dimensioned such that, when assembled, between about 8-12, or about 10 pounds of force is required for disassembly.

Functionally, the assembled present dispenser is attached to a container by threading the base 302 onto a container until a snug, airtight seal is effected by in part by contact between the base lower surface 320 and the container. The airtight seal is also effected when the cap 308 is in a closed position as described above. To dispense the material from the container, the cap 308 is displaced from the closed position to an open position. The cap 308 may be displaced from the closed position to the open position by an upward force exerted on the extension 430, e.g., by a user's digit. The upward force displaces the stopper element 432 from the upper extension bore 398 and also displaces the cap rib 434 from the second member groove 418. The substantially flowable material may be then forced from the container through the first member cavity 384 and the upper extension bore 398 and dispensed on a surface at a desired location. The flowable material is forced or urged from the container, for example, by squeezing the sides of the container or by using a plunger (if present). After use, the cap is replaced as described above to reseal the container and prevent the material within the container from deterioration due to evaporation.

A person of ordinary skill in the art will readily recognize that other equivalents can be utilized in place of the mating structure embodiments disclosed and described herein. Therefore, the instant invention is not limited to the specific embodiments of the mating structures disclosed and described.

Because numerous modifications of this invention may be made without departing from the spirit thereof, the scope of the invention is not to be limited to the embodiments illustrated and described. Rather, the scope of the invention is to be determined by the appended claims and their equivalents.